Listing of the Claims:

Claims 1-35. (cancelled)

36. (New) A method of monitoring renal tubular epithelial differentiation comprising:
a) isolating at least one cell
b) placing said cell into a rotating wall vessel containing a cell culture comprising culture media and culture matrix; and
c) monitoring expression of greater than one gene in an array, wherein ~~the~~ said expression of said genes is indicative of differentiated renal tubular epithelial cells.

37. (Currently Amended) The method of claim ~~27~~ 36, wherein each gene in said genes is selected from the group consisting of 1-α-hydroxylase, megalin, cubulin, erythropoietin, manganese super oxide dysmutase, interleukin-1β, a GABA transporter gene, β actin, villin, extracellular calcium sensing receptor, ICAM, VCAM, and γ-glutamyl transferase.

38. (New) The method of claim ~~27~~ 36, wherein said expression of [a] said genes is increased.

39. (New) The method of claim ~~29~~ 38, wherein each gene in said genes is selected from the group consisting of 1-α-hydroxylase, megalin, cubulin, erythropoietin, manganese super oxide dysmutase, interleukin-1β, a GABA transporter gene, β actin, villin, extracellular calcium sensing receptor, ICAM, VCAM, and γ-glutamyl transferase.

40. (New) The method of claim ~~27~~ 36, wherein said expression of [a] said genes is decreased.

41. (New) The method of claim ~~31~~ 40, wherein each gene in said genes is selected from the group consisting of 1-α-hydroxylase, megalin, cubulin, erythropoietin, manganese super oxide dysmutase, interleukin-1β, a GABA transporter gene, β actin, villin, extracellular calcium sensing receptor, ICAM, VCAM, and γ-glutamyl transferase.

42. (New) A method of producing active renal epithelial cells comprising:
a) isolating renal stem cells; and
b) culturing said cells in a rotating wall vessel containing a cell culture comprising culture media and culture matrix, wherein gravity is substantially balanced in said rotating wall vessel by equal and opposite physical forces comprising shear-stresses.

43. (New) The method of claim 34 wherein shear-stress response is reduced by the addition of a transcription factor decoy oligonucleotide encoding a shear-stress response element specific sequence.

44. (New) A method of producing active 1,25-dihydroxy vitamin D3 comprising:

a) isolating at least one cell;

b) placing said cell into a rotating wall vessel containing a cell culture comprising culture media and culture matrix; and

c) inducing 1,25-dihydroxy vitamin D3 production.